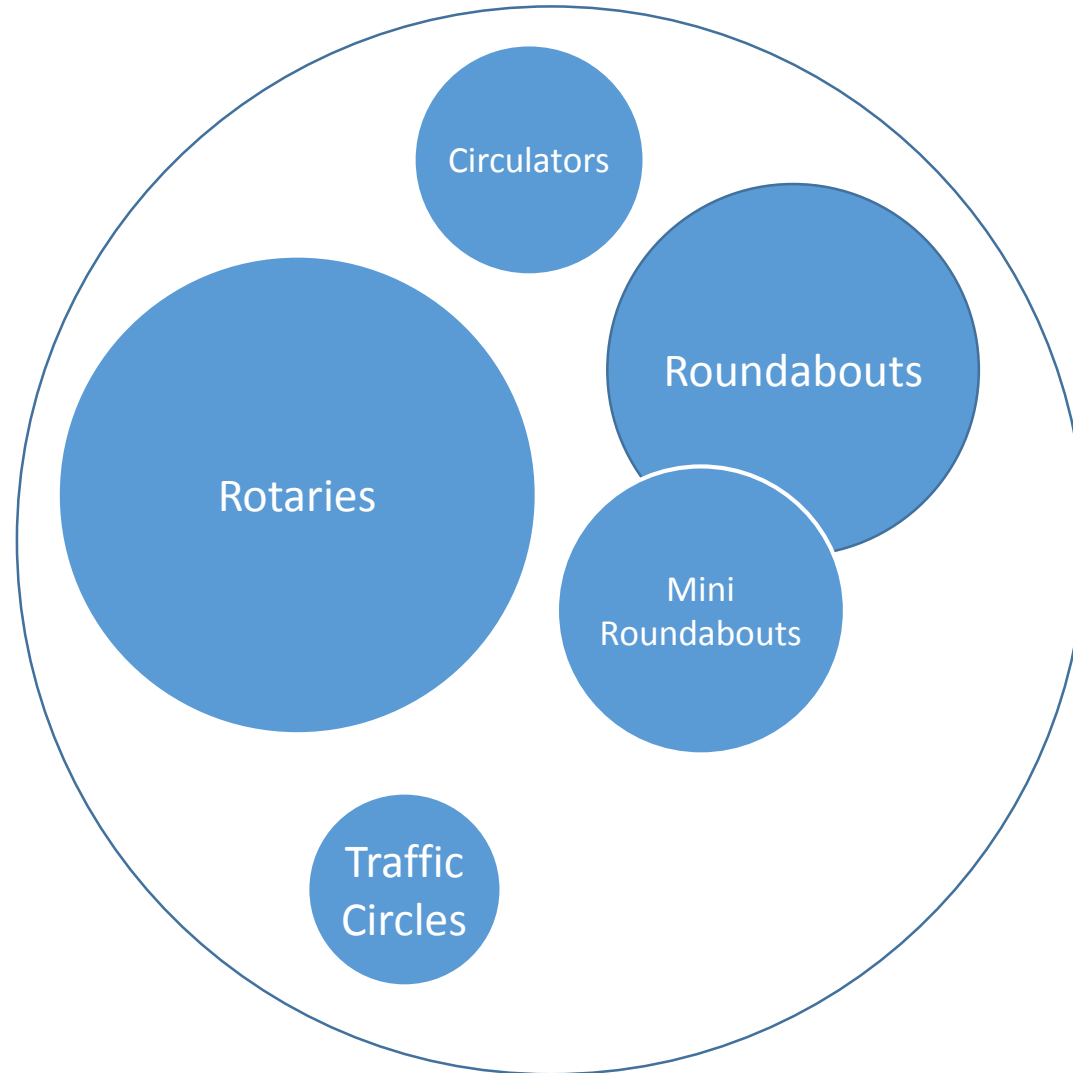


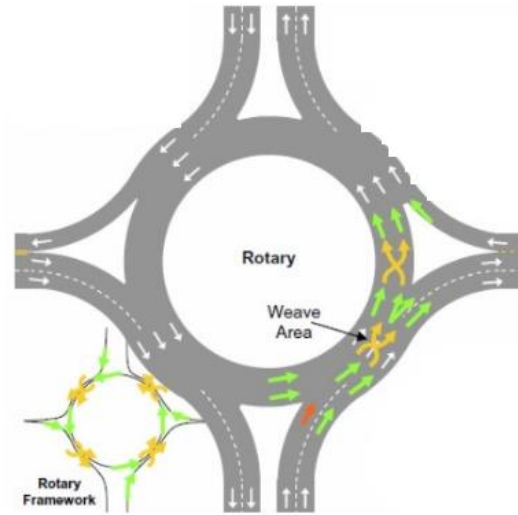
Roundabouts in Burlington

Public Works Commission

December 2018

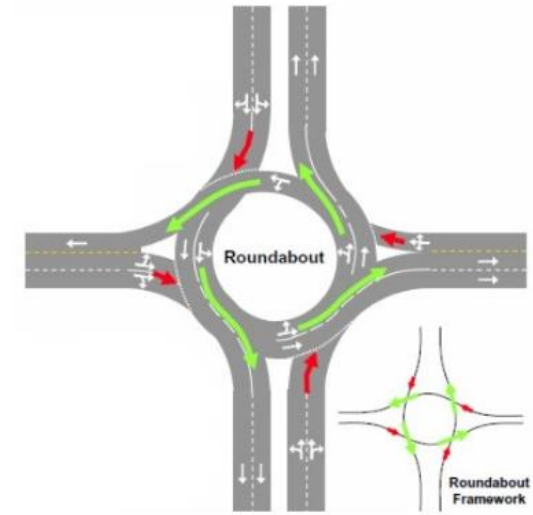
Circular Intersections





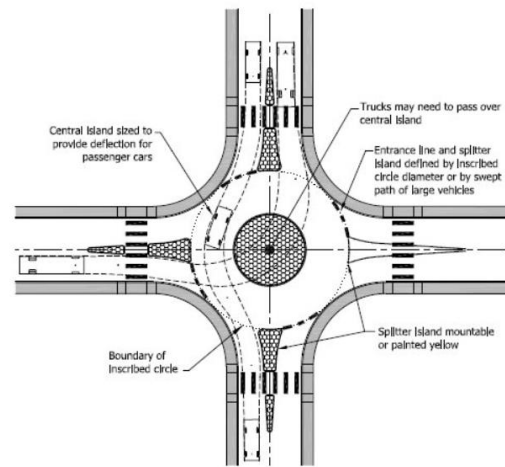
Rotary

- Generally larger and designed for higher speeds
- Do not always have yield control / speed control for entering vehicles



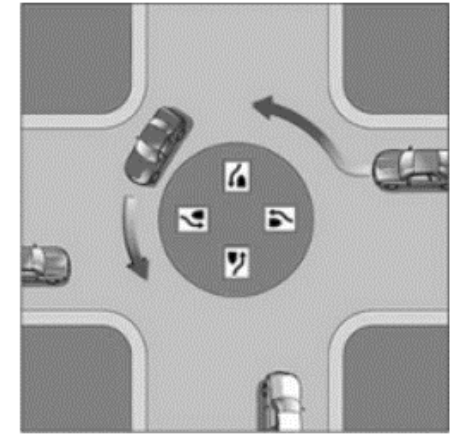
Roundabout

- Splitter islands for yield control and speed of vehicles entering
- Center island
- Shape can vary
- Number of lanes can vary
- No traffic signals (circulator)



Mini Roundabout

- Single lane
- Splitter islands are raised, mountable
- Center island is raised, mountable
- Generally 45' – 90' diameter
- Lower cost and smaller footprint than standard roundabout

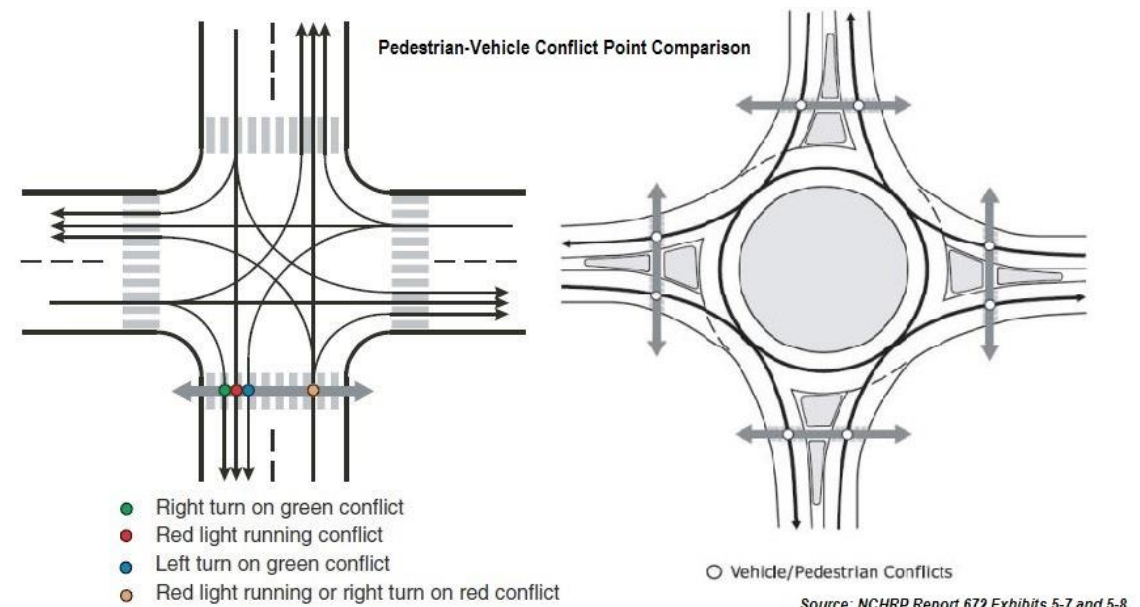
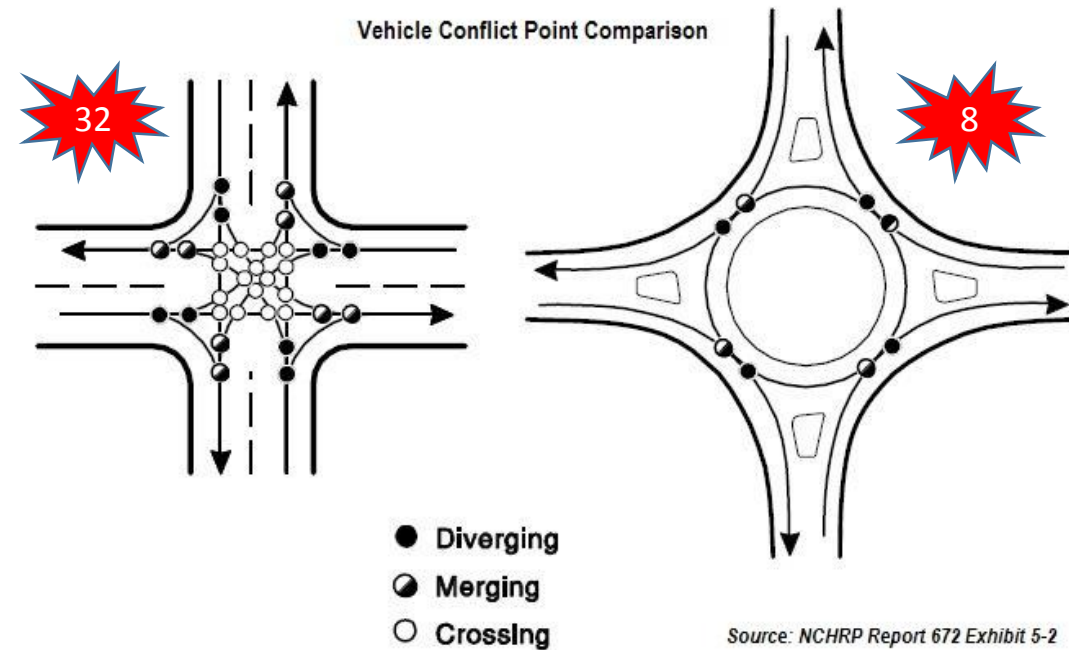


Traffic Circle

- Single lane
- No yield control for vehicles entering
- No crosswalk adjustments
- Slow traffic in a residential area with low traffic volumes
- May beautify the street
- Large vehicles turn left around or in front of circle

Roundabout Benefits

- Slow speeds through the intersection
- Fewer conflict points
- Less severe conflicts
- Often safer than conventional intersections
- Aesthetic opportunities
- Can be less expensive than conventional intersections
- Reduced vehicle idling
- Can improve traffic operations*



Considering Roundabouts in Burlington

Design Approach

- Roundabouts are considered as an alternative in any intersection scoping or redesign
- FHWA Guidance for Mini-Roundabouts
 - % truck traffic, number of lanes, traffic volumes on approaches, peak traffic
 - CAP-X Planning Capacity Tool

Urban constraints

The additional ROW needed for turning/storage lanes is often much more extensive than the corner properties needed for a roundabout



Urban Roundabout
Alternative



Improved Signalized
Intersection Alternative

Projects that did not consider roundabouts

- Archibald St / Winooski Ave Study (2011) – limited scope for small-scale improvements
- Pearl St Corridor (2015) – limited scope for interim-design alternatives
- Bike Path Intersection Scoping (2014)

Projects that considered circular intersections

- Strong St / Blodgett St traffic circle
- South End neighborhood traffic calming
- North / South Bicycle & Pedestrian Route Study & planBTV Walk Bike
- Shelburne St Roundabout (2021 construction)
 - Vermont Agency of Transportation Highway Safety Program – 100% funding for eligible costs
- Champlain Parkway
- North Ave / Rt 127 Intersection Scoping
- Colchester Ave / Pearl St / Prospect St Scoping
- Winooski Ave / Howard St / St Paul St Scoping
- North Ave Corridor
 - North Ave / Ethan Allen Parkway Scoping (underway)
- Colchester Ave / Riverside Ave / Barrett St / Mill St Scoping
- Neighborhood Greenways
- North Ave / South Road (Cambrian Rise)
- Winooski Ave Corridor Transportation Study (underway)



2005 North / South Bicycle & Pedestrian Route Study

Winooski Avenue

Improved safety for pedestrians and
bicyclists

Improved streetscape and cityscape



2017 planBTV Walk Bike

LOCATION*	URBAN ROUNDABOUT	MINI-ROUNDABOUT	TRAFFIC CIRCLE
Archibald & Intervale		X	X
Colchester & East Ave	X	X	
Colchester & Prospect & Pearl		X	
Colchester & Riverside & Barret	X		
Howard & St Paul & Winooski		X	
Intervale & Oak & Riverside		X	
Lakeside & Pine	X		
Loomis & North Prospect			X
Main & South Prospect	X		
Manhattan & Spring		X	
Maple & Battery	X	X	
Maple & Summit			X
North Ave & Institute	X		
North Ave & Plattsburg		X	
North Ave & Route 127 Ramps	X		
North St & North Prospect		X	
North St & North Willard		X	
North Willard & Loomis		X	

LOCATION (CONTINUED...)	URBAN ROUNDABOUT	MINI-ROUNDABOUT	TRAFFIC CIRCLE
Pearl & Willard		X	
Pine & Flynn		X	
Pine & Home		X	
Randy & Hope			X
Shelburne & Flynn	X		
Shelburne & Home	X		
Shelburne Road Rotary	X		
Shore & Dale			X
South Winooski & Bank	X	X	
South Winooski & Cherry		X	
South Winooski & College		X	
South Winooski & Main	X	X	
South Winooski & Pearl	X	X	

*Not that the locations in the charts above are intended to be an initial list of suggestions, not a comprehensive analysis. More detailed, further review may identify additional opportunity sites.

Roundabouts: A Field Guide

Roundabouts offer many benefits, including increasing safety, road capacity, and design, and they are a tool that should be considered for Burlington's intersections. Single lane roundabouts have an excellent safety record for all modes of transportation, and can accommodate car traffic in fewer lanes, potentially leaving more room on the streets for biking and walking. (Note that multi-lane roundabouts lose many of the safety benefits of single-lane roundabouts.) Roundabouts come in many sizes and styles, and each type has a place on Burlington's streets. See the following page for details about potential opportunity sites for each of the roundabout types described below.



Main and High Street roundabout in Plymouth, NH between downtown and Plymouth State campus.

MODERN URBAN ROUNDABOUT

Definition: Typically greater than 90 feet in diameter (measuring the outside edge of the traffic portion), these roundabouts especially good for slowing down traffic, thus increasing safety for everyone.

Cost Range: Typically \$3 to \$5 million, due to high design and engineering complexity, and need for acquiring property, relocating utilities, etc.



Mini-roundabout from Fort Collins, CO

MINI-ROUNDABOUT

Definition: Have many of the same features of a full sized roundabout, but in a pint-sized version. Mini-Roundabouts are completely "mountable" by larger trucks.

Cost Range: Much lower than Modern Urban Roundabouts. Depending on design, can range from \$100,000 to \$300,000. Vermont's first Mini-Roundabout is located in Manchester, VT.



Flickr: Dylan Passmore

NEIGHBORHOOD TRAFFIC CIRCLE

Definition: Roundabout used for traffic calming and beautification on low volume neighborhood streets. Large vehicles have to make their left turns "left of center" of the island.

Cost Range: Less than \$50,000, depending on materials and landscaping.

Champlain Parkway

2011 Act 250 Permit Preparation

Roundabouts were compared to signalized intersections at 4 locations

Not recommended or selected

2015 Safety Improvements

Intersection reconfigurations are now beyond what is feasible at this stage of the project in order for our partners to continue the project (only safety improvements that do not impact operational performance or trigger permit reevaluation)



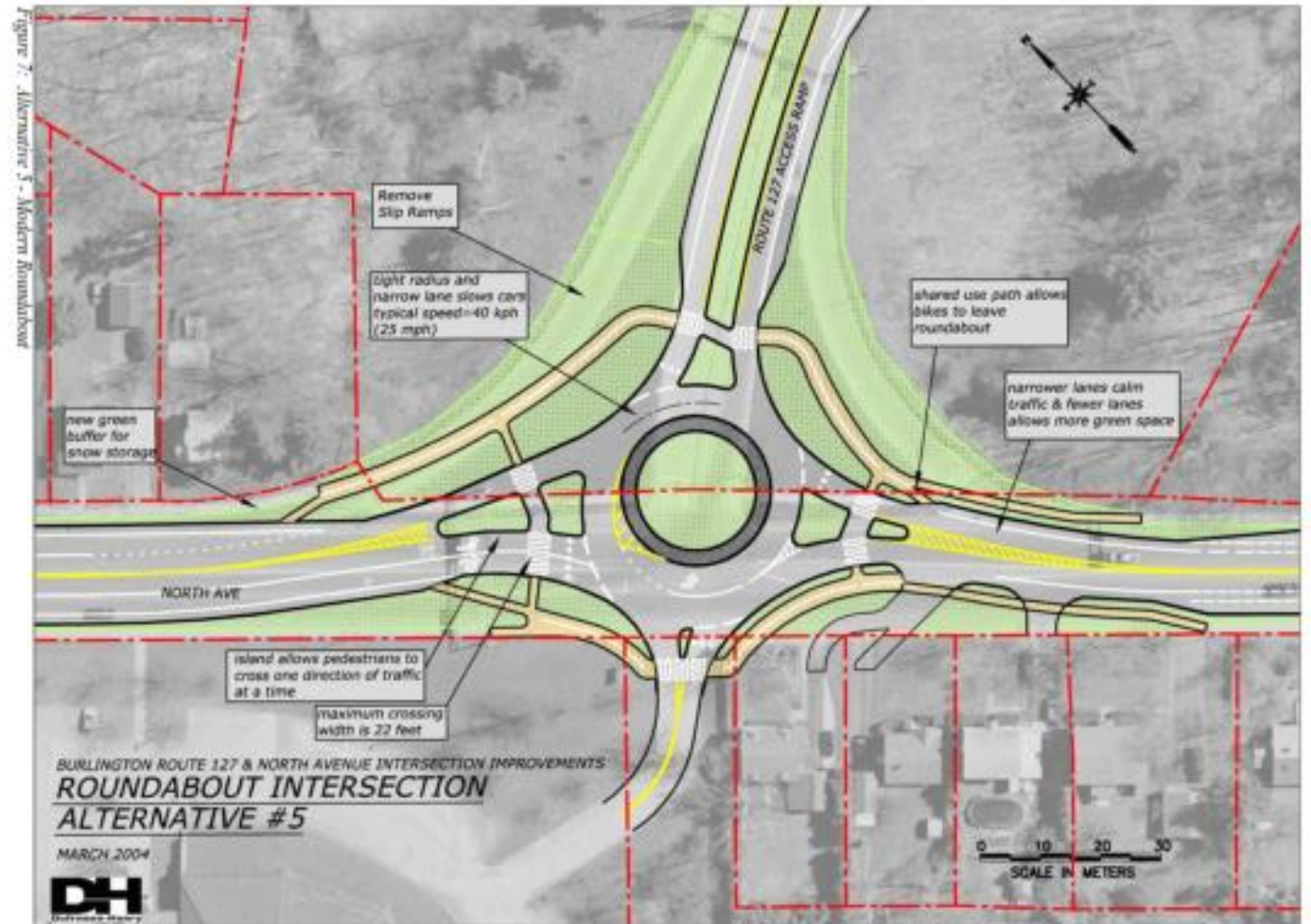
2005 North Ave / Rt 127 Intersection Scoping

Alternative 5:

Strong technical alternative

Limited community support in 2005

More community support during the North Ave Corridor Study. Will be evaluated again in supplemental scoping.



2015 North Avenue Corridor Study

Recommends intersection scoping to include:

Plattsburg Ave mini roundabout

VT 127 roundabout

Institute Rd roundabout

Ethan Allen Parkway roundabout (**scoping underway for roundabout and signalized alternatives**)

Figure 81: Plattsburg Ave Concept 3

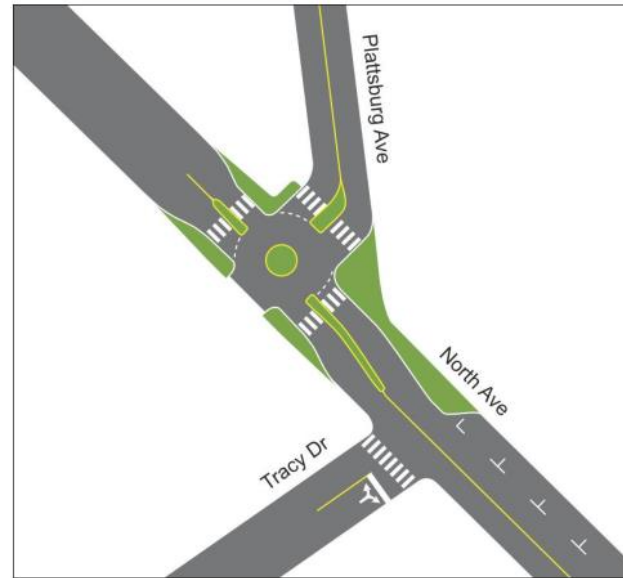


Figure 87: Ethan Allen Parkway Concept 2 (Three Lanes)

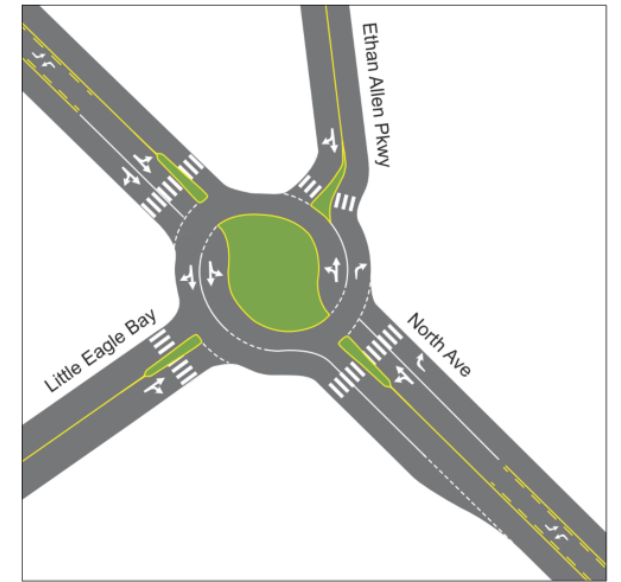


Figure 90: VT 127 Ramps Concept 3 (Three Lanes)

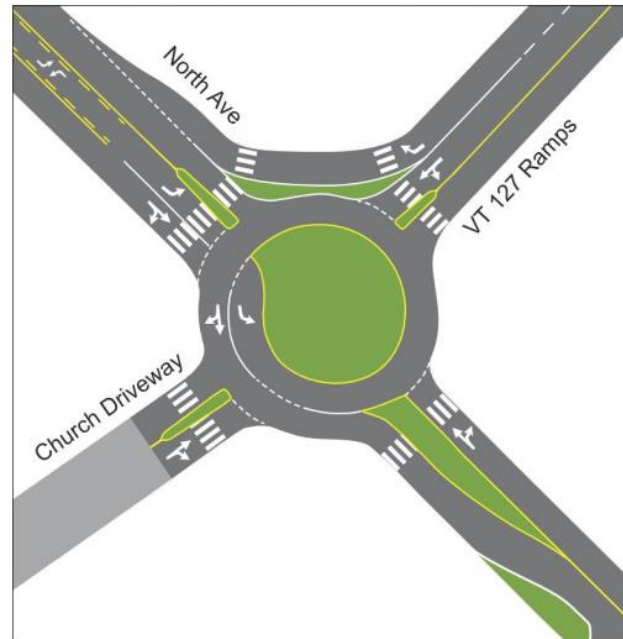
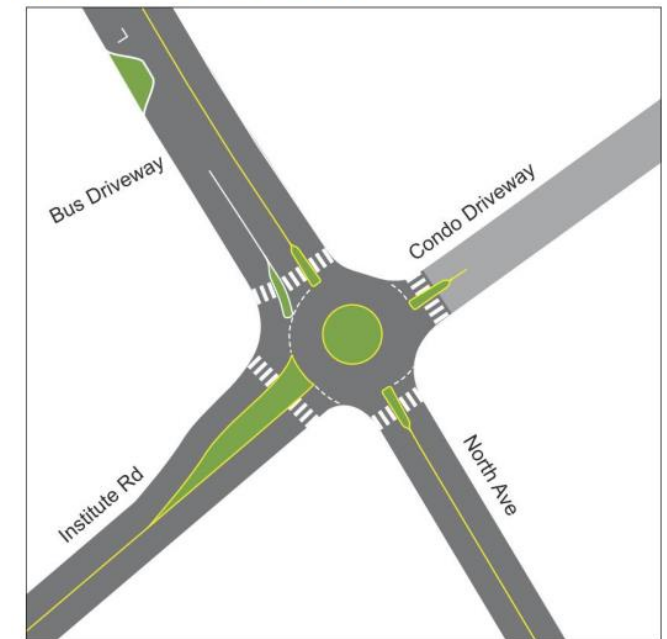


Figure 92: Institute Road Concept 2



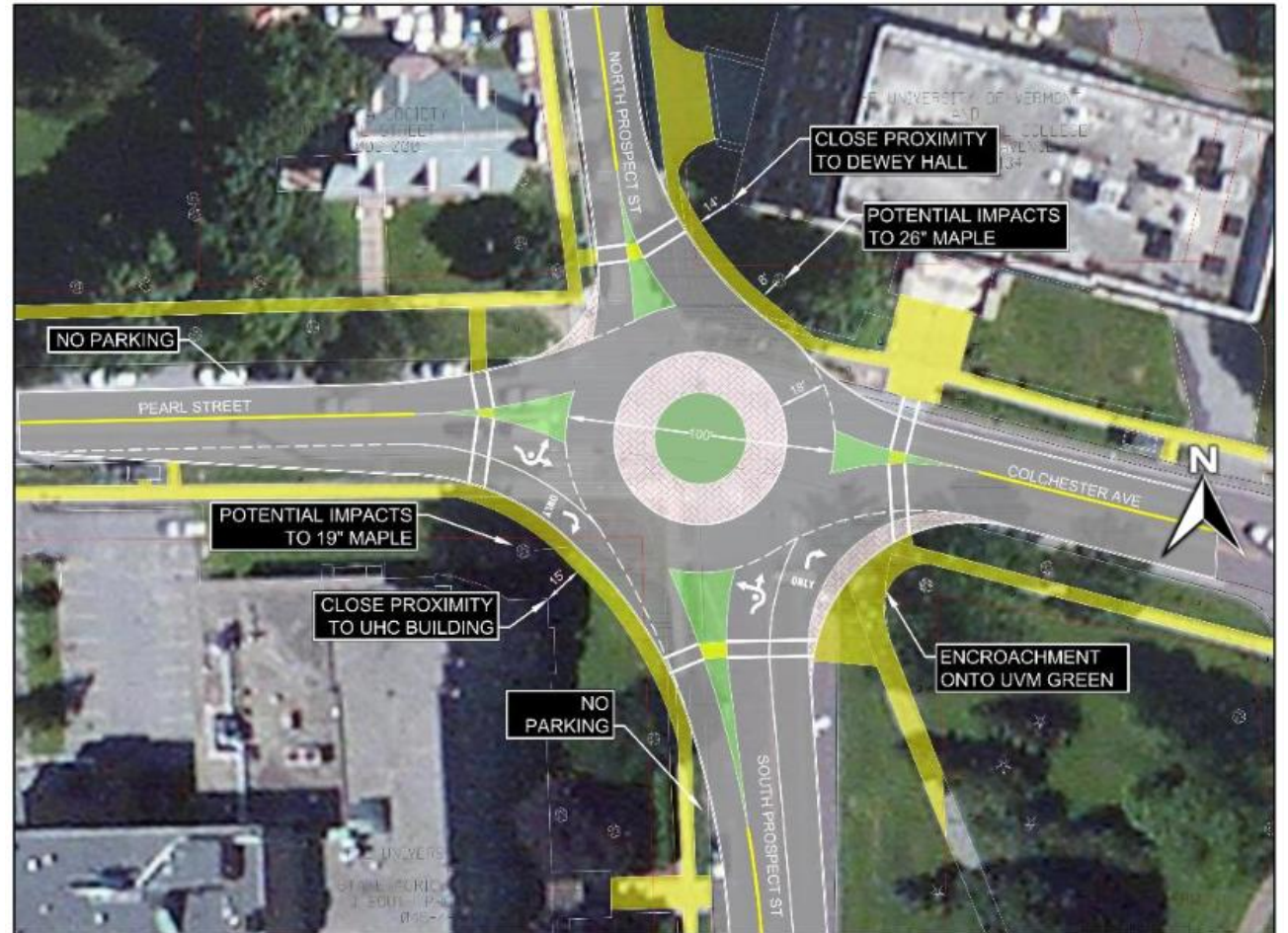
2013 Colchester Ave / Pearl St / Prospect St Scoping

Alternative 3:

Traffic analysis (Sidra) showed significant westbound congestion (LOS D-F)

Parking impacts

Close proximity to two buildings



2018 Winooski Ave / Howard St / St Paul St Scoping

Alternative 4: Dual Roundabouts

\$1.9 - \$2.4 mil

Take one property

Potvin Park impacts

3 driveways within roundabout

Parking loss (5 off street, 8 on-street)

Alternative 5: Modern Roundabout

\$1.6 - \$2.1 mil

Take two properties

Impact one historic structure

Parking loss



Evaluated but not feasible as an alternative:

- Mini roundabout
- Dual roundabout centered on S. Winooski Ave
- Signalized intersection adjacent to roundabout

2018 Colchester Ave / Riverside Ave / Barrett St / Mill St Scoping



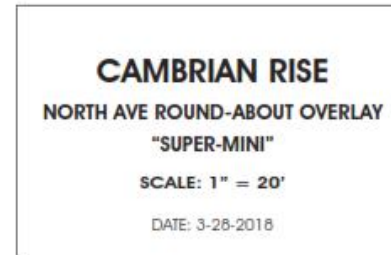
CRITERIA	No Build	Short Term Improvements	Alternative 1 4 Way Intersection	Alternative 2 4 Way Intersection w/ Separate Right Lane	Alternative 3 Roundabout
Project Costs	\$0	\$875,000	\$3,300,000	\$3,430,000	\$6,700,000
PURPOSE AND NEED					
Improves Pedestrian Safety	No	Some	Better	Better	Best
Provides Safer Bicycle Connectivity Winooski to Burlington	No	Some (allows safer east/west bicyclist movements)	Some (protected bike lanes south of Barrett and south of Mill northbound)	Some (protected bike lanes south of Barrett and south of Mill northbound)	Some (protected bike lanes south of Barrett)
Reduces Potential for Crashes	No	Some	Better	Better	Best
Reduces Intersection Complexity	No	No	Best	Best	Better
Manages Peak Hour Congestion	No	Some	Some	Better	Best
IMPACTS					
ROW Impacts	None	None	Minor (1600 sf)	Minor (1600 sf)	Major (4000 sf/ 1 house)
Historic Resources	None	None	None	None	Major (Removes 4(f) resource)
Stormwater	No change	No Change	Treatment opportunity	Treatment opportunity	Treatment opportunity
Net Change in On-street parking spaces	0	Some (-1 – N. of Barrett St. -2 – S. of Barrett St.)	More (-5 – N. of Barrett St. -2 – S. of Barrett St.)	More (-5 – N. of Barrett St. -2 – S. of Barrett St.)	More (-5 – N. of Barrett St. -2 – S. of Barrett St.)
Aerial Utilities	0	0	Some (3 poles relocated along Colchester Ave)	Some (3 poles relocated along Colchester Ave)	Some (3 poles relocated along Colchester Ave)

2018 North Ave / South Road (Cambrian Rise)

City Engineer consulted with FHWA, Vtrans,
TRB publications

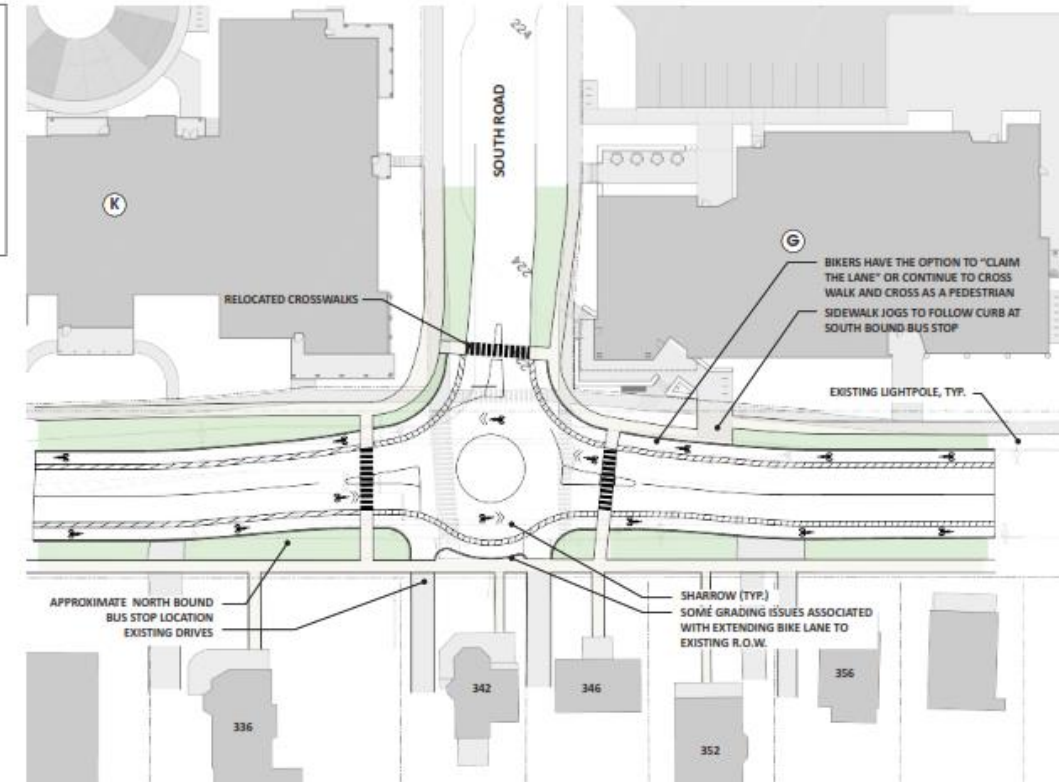
Traffic volumes are anticipated to exceed
intersection capacity by 2020:

- 1300 VPH suggested for mini roundabouts; 1700+ VPH projected for Cambrian Rise in 20 years
- minor street traffic is only 23%, which would function until 12,500 VPD; projected to exceed this by 2020



DESIGN CRITERIA

- INSCRIBED CIRCLE DIAMETER - 57'
- CENTER ISLAND DIAMETER - 27'
- LANE & ENTRY LANE WIDTH - 10.5'
- CIRCULATING WIDTH - 15'
- MOUNTABLE SPLITTER AND CENTER ISLANDS
- BIKERS HAVE OPTION TO CLAIM LANE
- OR - USE CROSSWALK
- INSTALL RRFB'S AT CROSSWALKS



BURLINGTON ROUNDABOUT HES 5000(18) CONCEPTUAL PLAN



VT STATE PLANE GRID

EXAMPLES OF WALL



EXAMPLE OF TRACKING APRON



EXAMPLE OF A STAMPED PATTERN



EXAMPLE OF TRUCK APRONS



EXAMPLE OF RAISED CROSSWALK



EXISTING "ROTARY"



LEGEND

- BUILDING/STRUCTURE
- ROADWAY
- GREEN SPACE
- DRIVEWAYS & PARKING LOTS
- CROSSWALK
- SIDEWALK & SHARED-USE PATH
- ISLANDS & APRONS
- EXISTING ROW
- ULTIMATE CURB LINE

EXAMPLES OF BIKE RAMPS & SHARED-USE PATHS



EXAMPLES OF A.D.A. DETECTABLE WARNING SURFACE



EXAMPLES OF SPLITTER ISLANDS



What's Next?

We keep trying!

- 2018 Vtrans Bicycle & Pedestrian Program – unsuccessful scoping request for Colchester Ave / East Ave intersection; potential candidate for 2019
- Intersection reconstruction is expensive and funding is limited